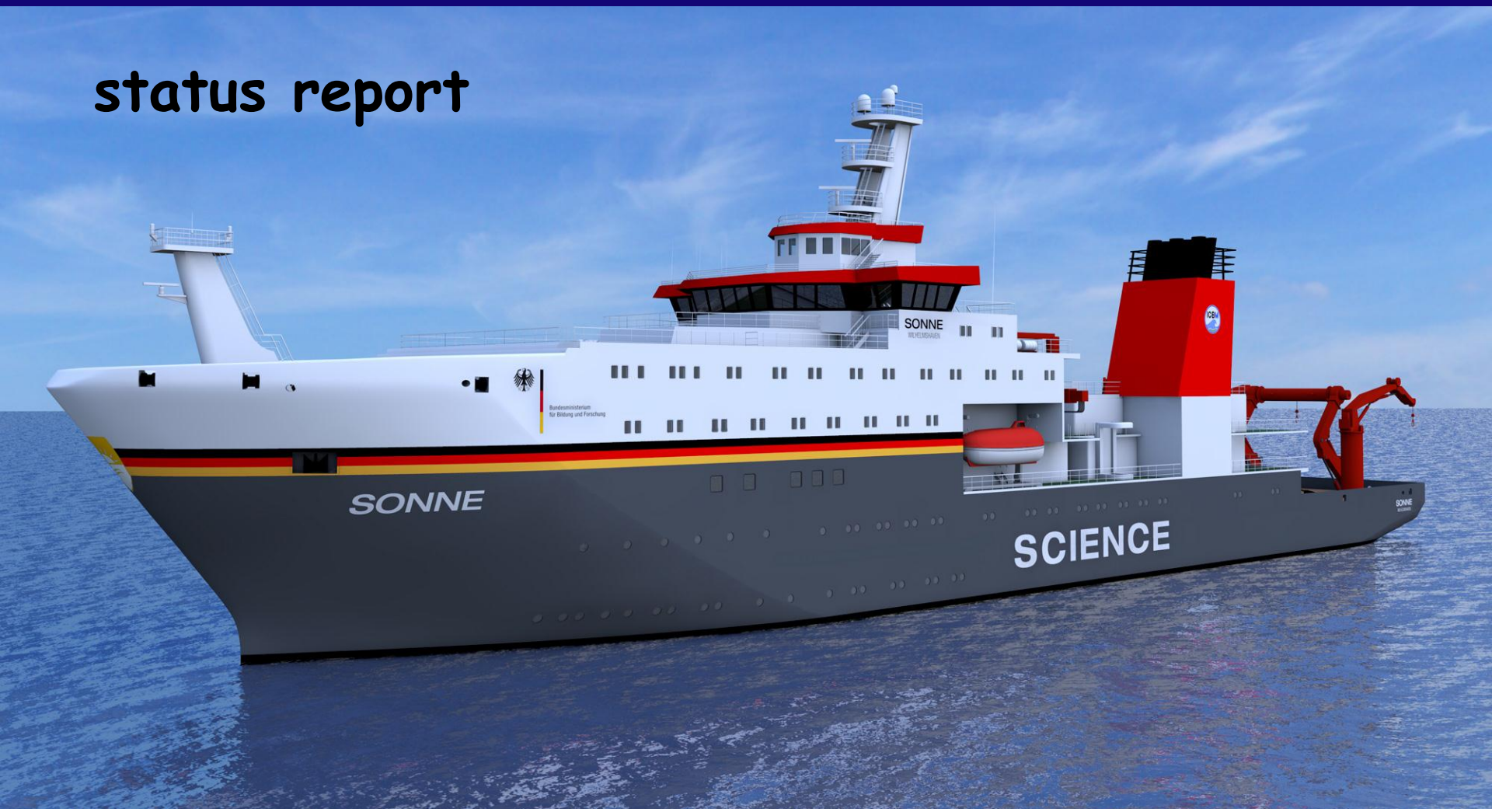
replacement SONNE

status report



Klaus von Bröckel, ERVO, May 2012

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Preliminary remark:

Tendering procedure started in 2009. For the first time the tender was for the construction as well as for the operation of the ship for 10 years. That is for a consortium consisting of a shipyard and a shipping company. Four consortiums submitted an offer. Than, the whole process of negotiating (with several offers and tenders) took nearly 1.5 years. Finally, in July 2011 the contract was signed for the construction of the ship as well as for operating the ship for 10 years.
Construction is taking place within the Meyer Shipyard company in Papenburg (famous for huge cruise liners) at the Neptun shipyard in Warnemünde.
Ship operator will be the Reedereigemeinschaft Forschungsschiffahrt (RF) in Bremen (owner of the old SONNE).

short history:

1969	built as stern-trawler
1977	conversion to global multidisciplinary research vessel
1991	extension and modernisation
work area:	mainly Pacific und Indic Ocean
field of work:	mainly geophysics and multidisciplinary oceanography
owner:	RF-GmbH, Bremen

http://www.rf-gmbh.de/galerie.php

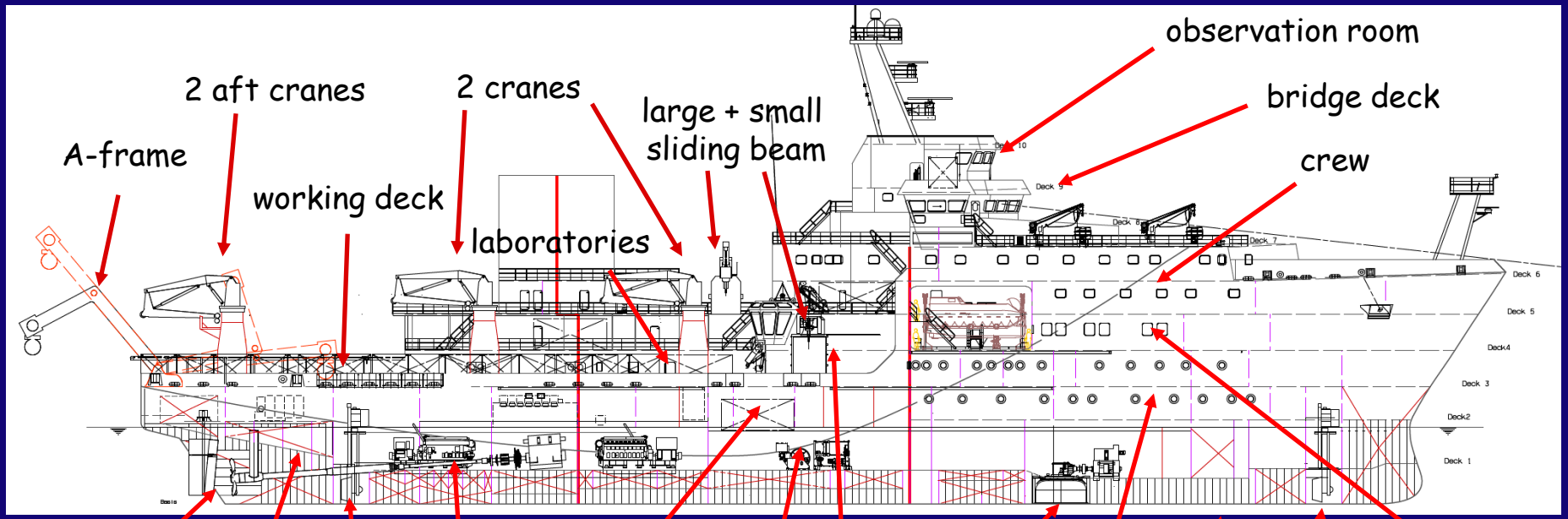
RV SONNE

general data

	new	old
length:	112,4 m	87,00 m
width:	20,6 m	14,20 m
draught:	6,4 m	6,80 m
displacement:	about 8.800 t	4.734 t
speed:	15 kn	12,5 kn
crew:	32 pers.	25 pers.
scientists:	40 pers.	25 pers.
propulsion:	diesel-electric	diesel-electric
endurance:	50 days	50 days
cables + wires:	8.000 m	max. 8.000 m
scientific rooms:	550 m^2	450 m^2
working deck area:	700 m^2	260 m^2
20'-container:	25 (4 inside)	7,5 (2 inside)
scientific store room:	150 m^2	50 m^2
ICES 209:	yes	no

RV SONNE

general arrangement



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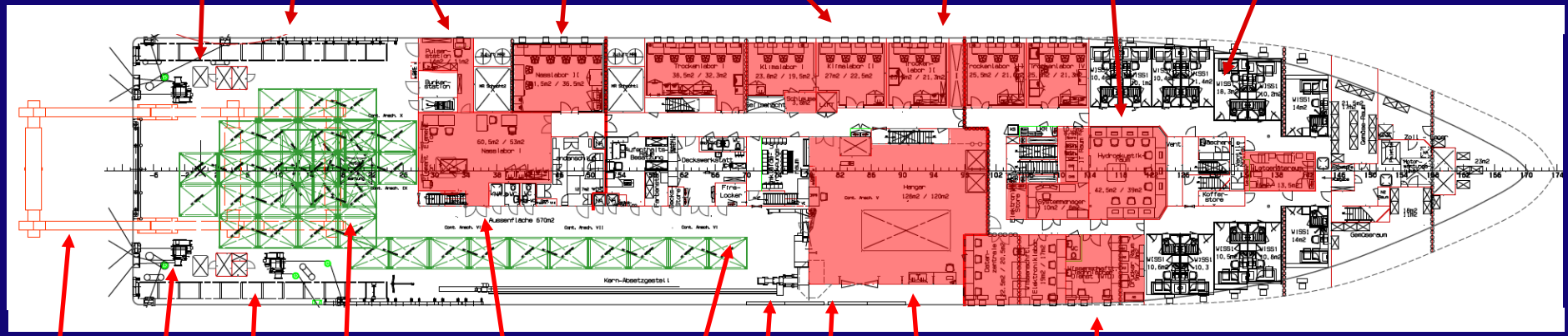
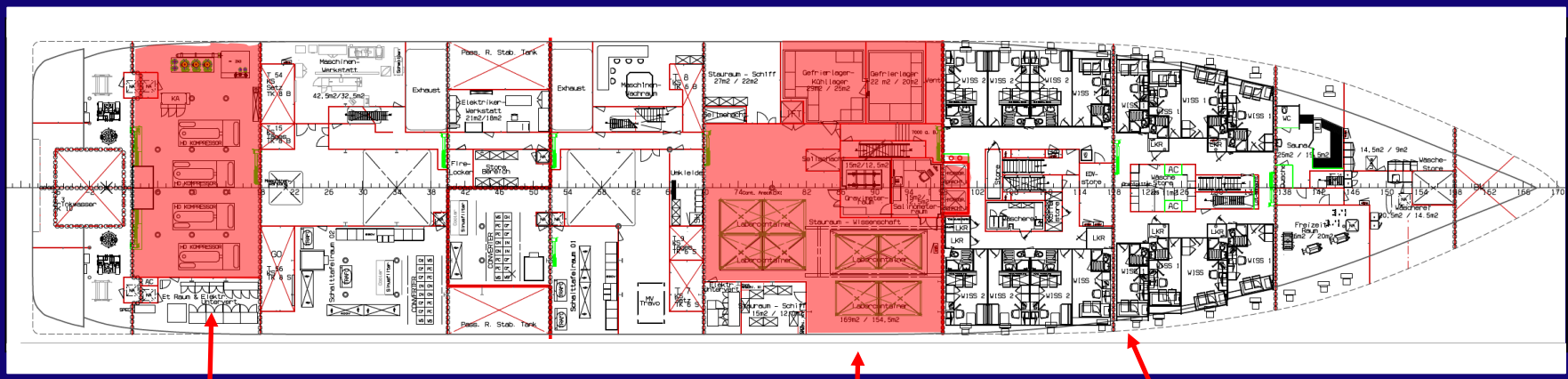
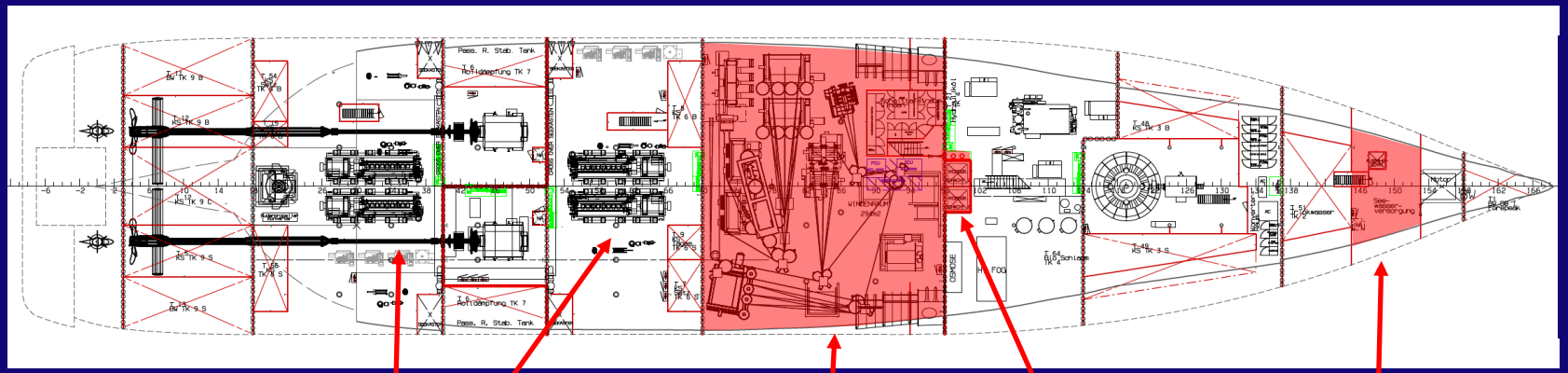
third deck (working deck)

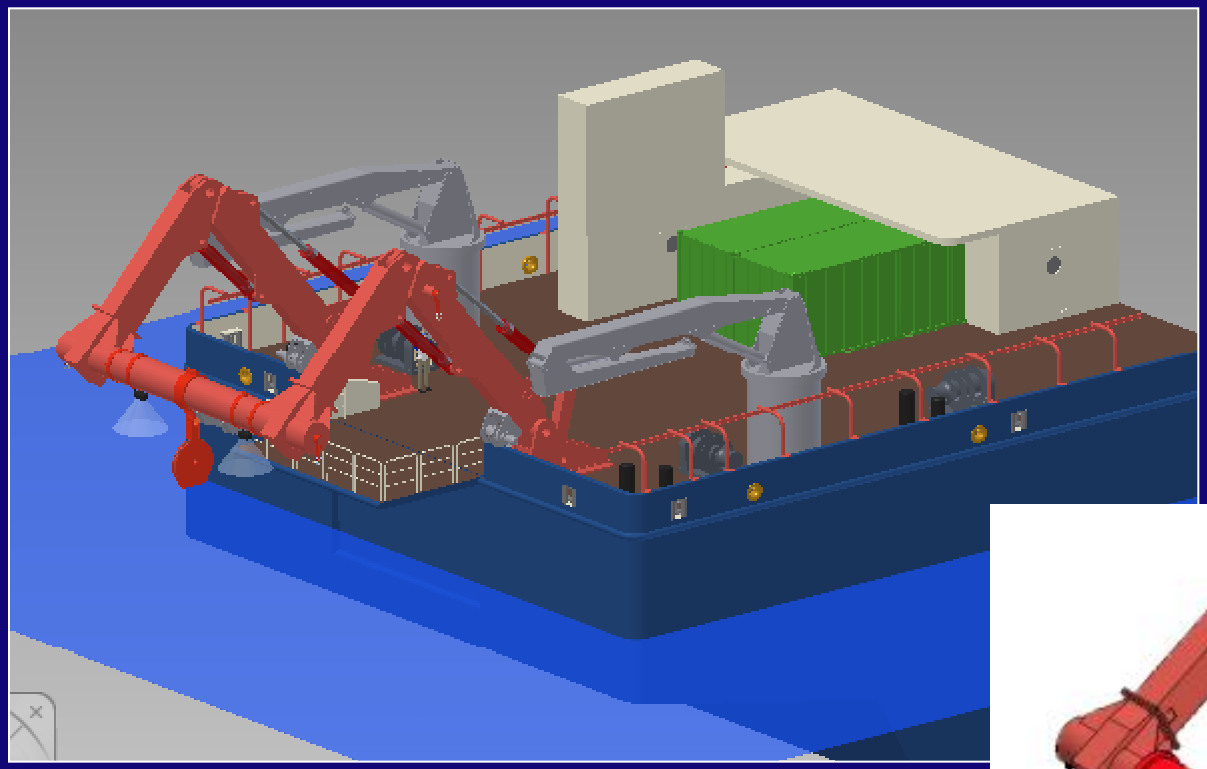


second deck


geophysic compressors
scientific store + container room
scientists accomodation

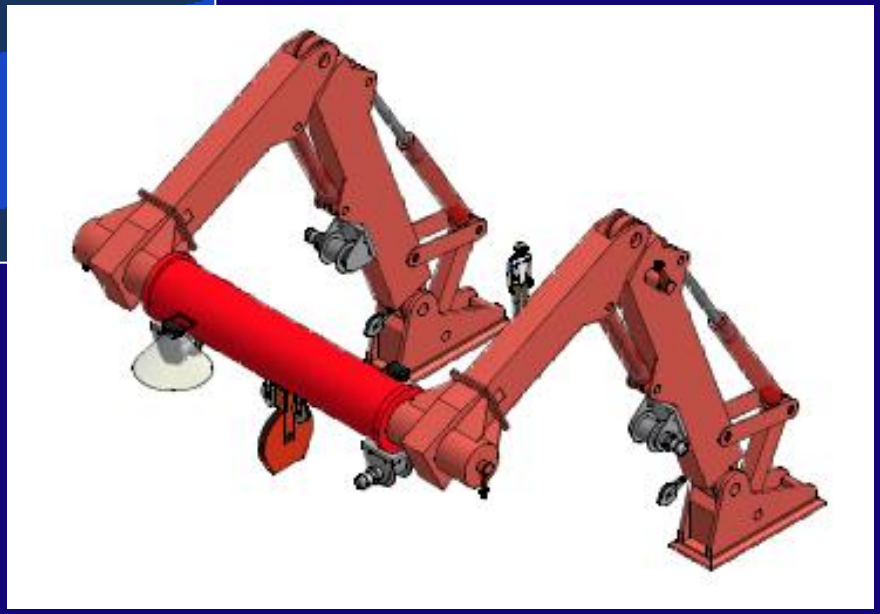
first deck


redundant machinery
winch room
hydrographic wells
seawater room



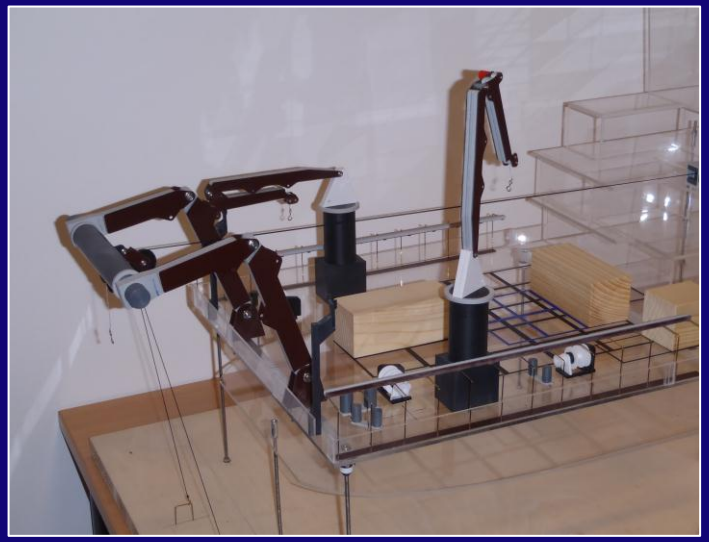
folding A-frame

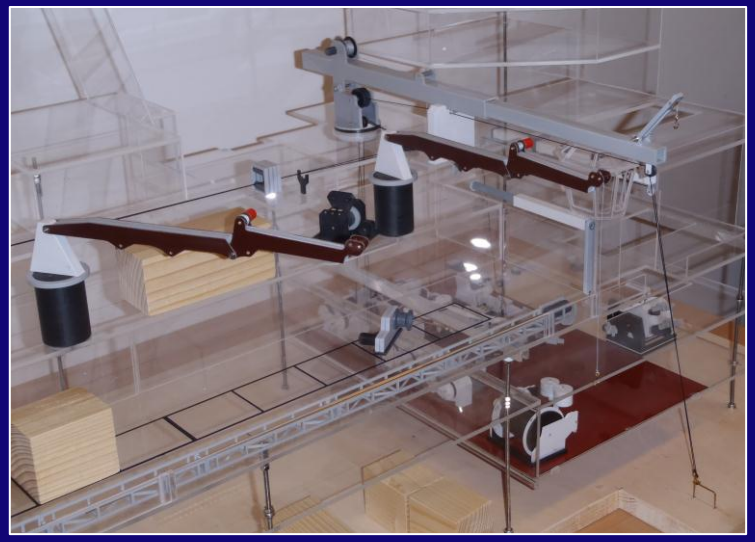
30 t



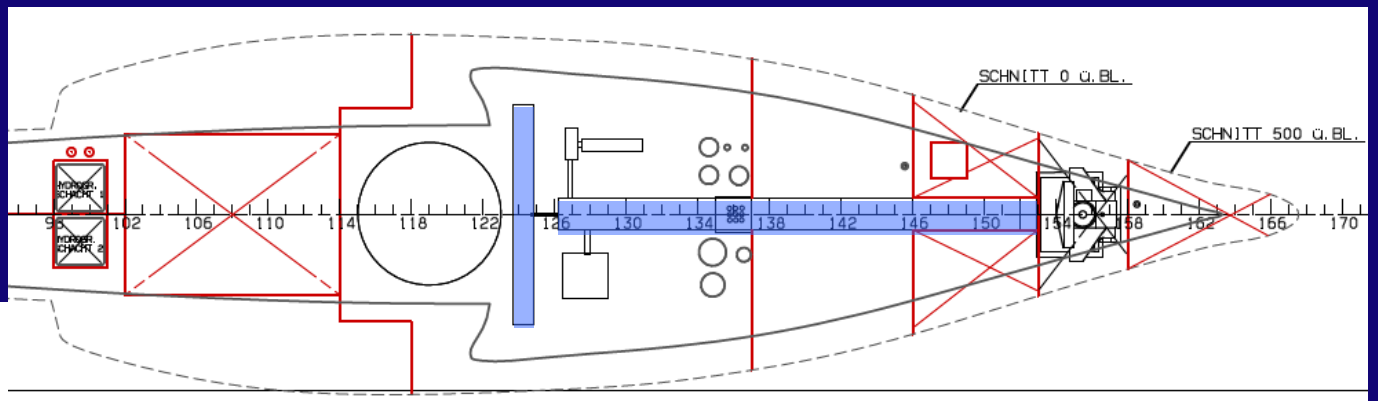
multifunction cranes:

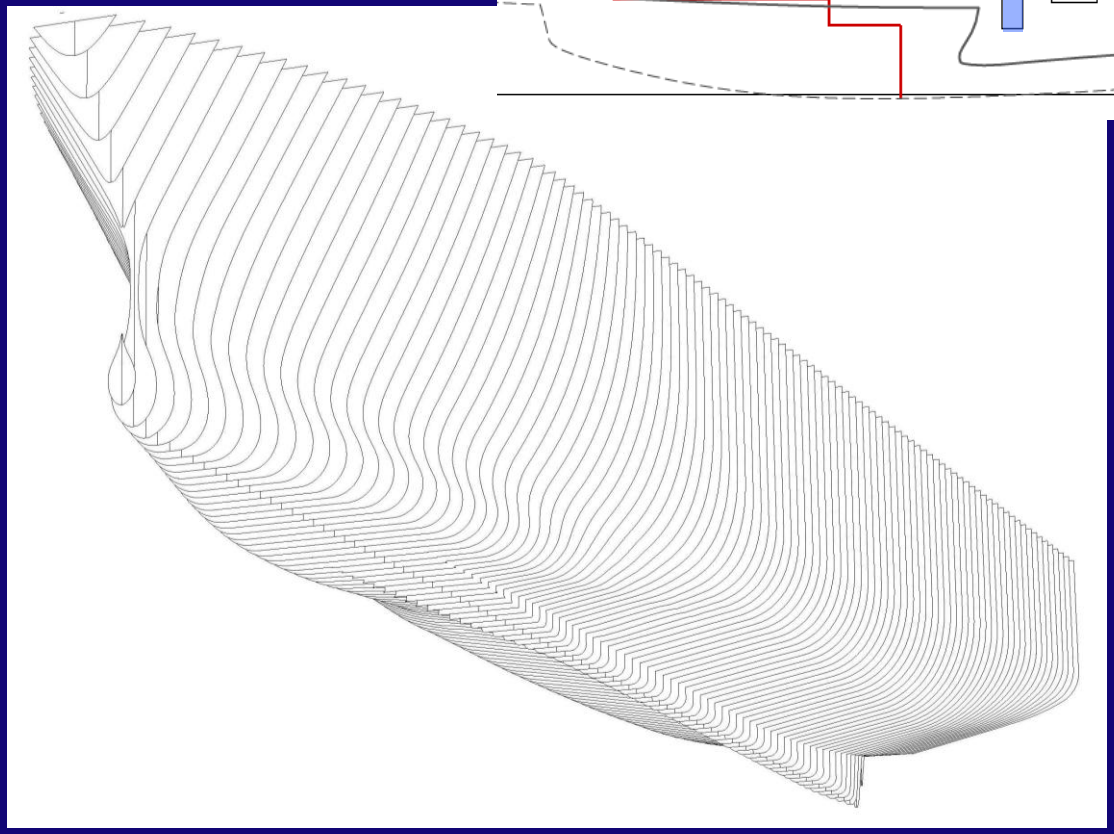
- offshore (SWL 6 t)
- harbour (SWL 10 t)





model of working deck (scale 1:50) with all lifting devices (cranes, frames, beams and winch room) allows to simulate all desired functions and helps to find weak points as well as necessary changes





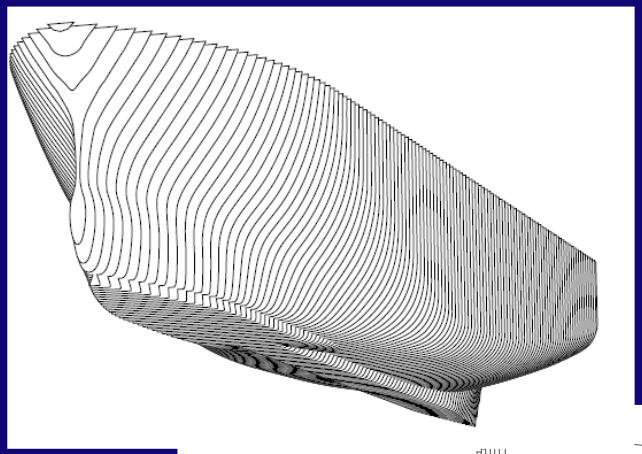
echosounder challenge:

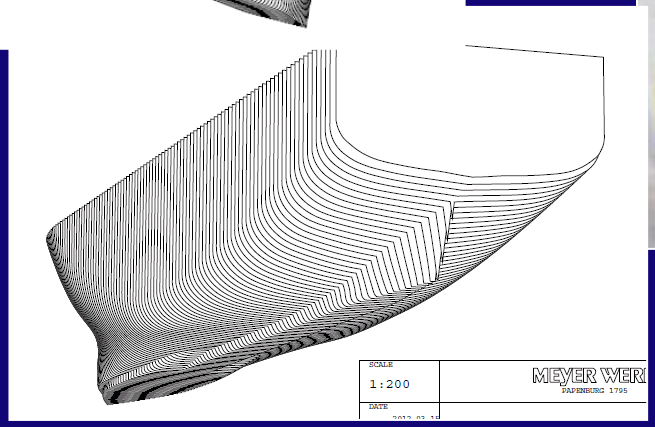
- avoid bubble sweedown
- huge transducers for deep-sea multibeam echo-sounder (0.5° x 1° beam-opening total space - 16 m x 8 m)

first solution:

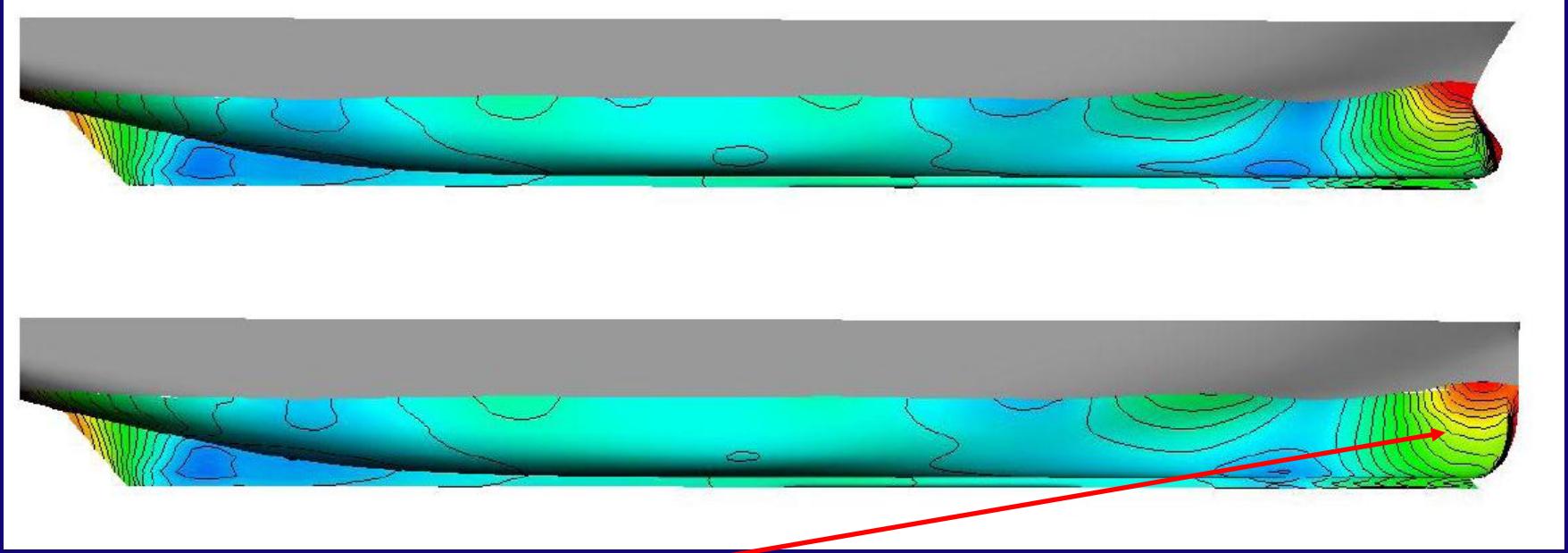
first drawing 'dent' plus integrated gondola

- first tank tests resulted in max. speed of 15.3 kn (15 kn required)
- shipyard put 'cowcatcher' underneath (they called it 'iron')

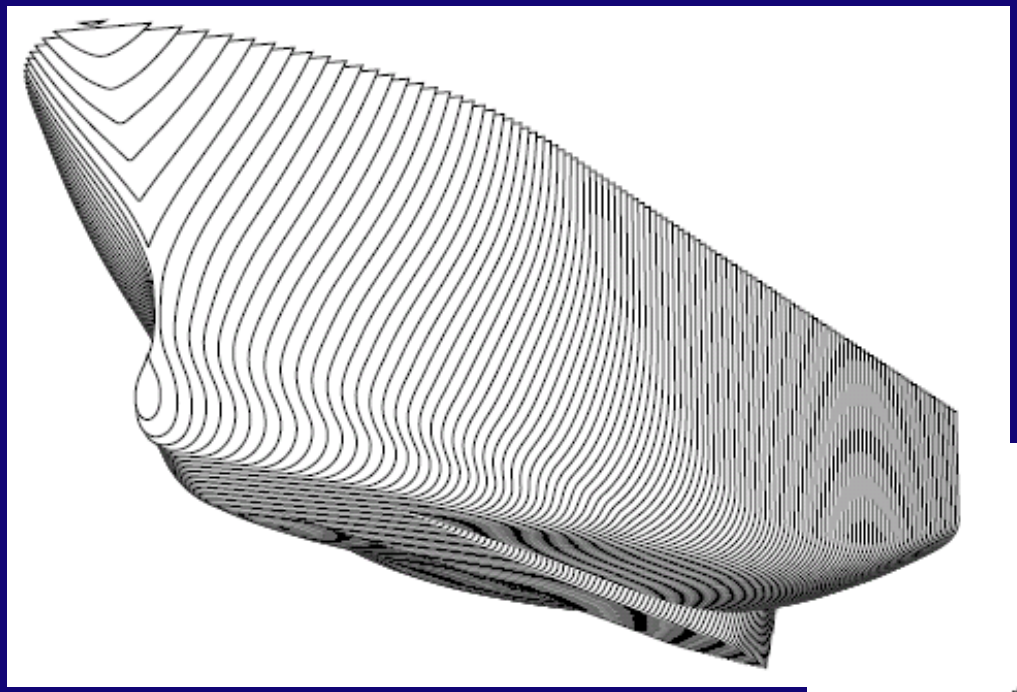


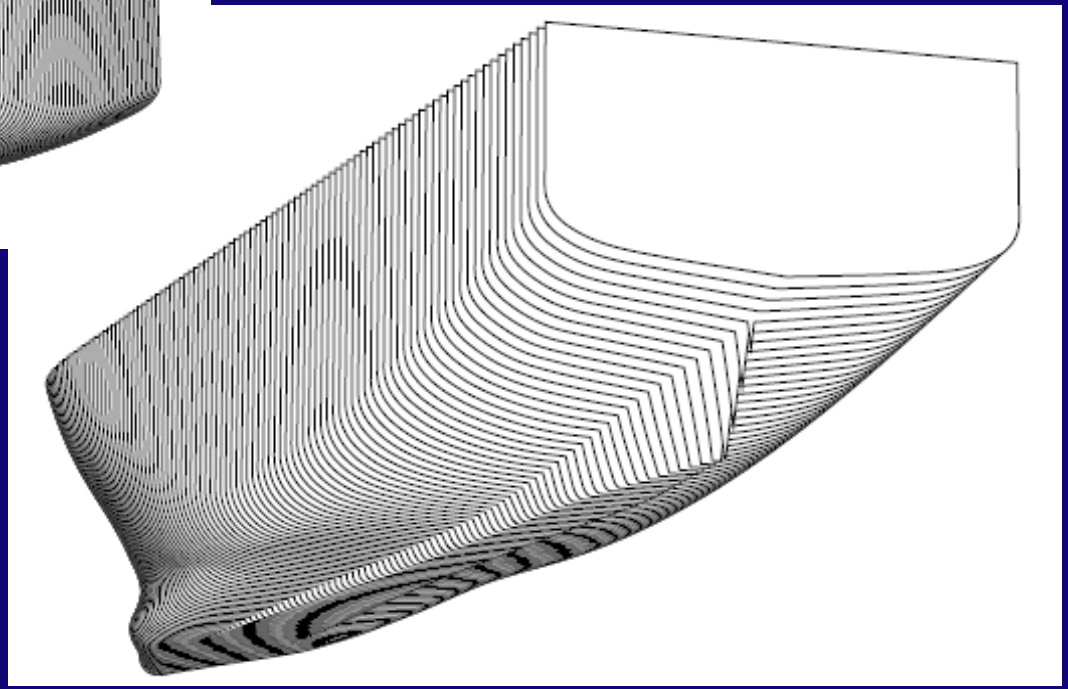


- next tank tests revealed: 20 to 25 % more power needed to reach same speeds as without 'cowcatcher' !!

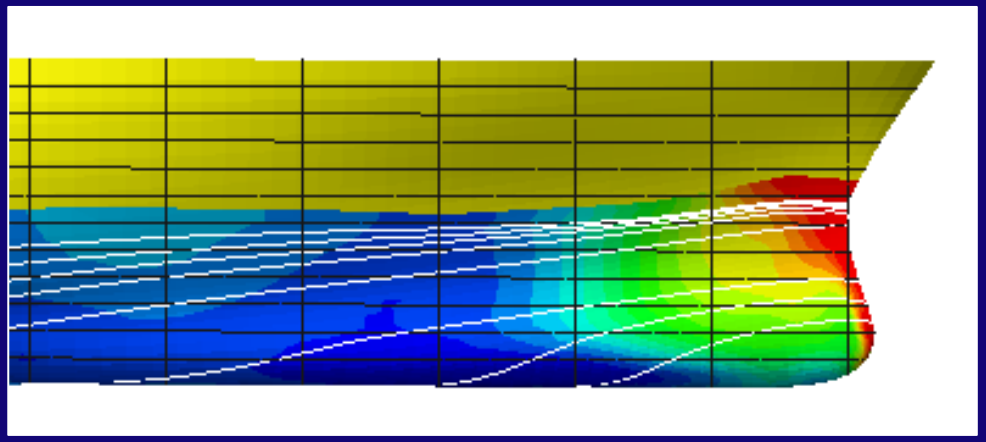


- a different bow-form and some small changes might have resulted in about 4 % less loss due to 'cowcatcher'

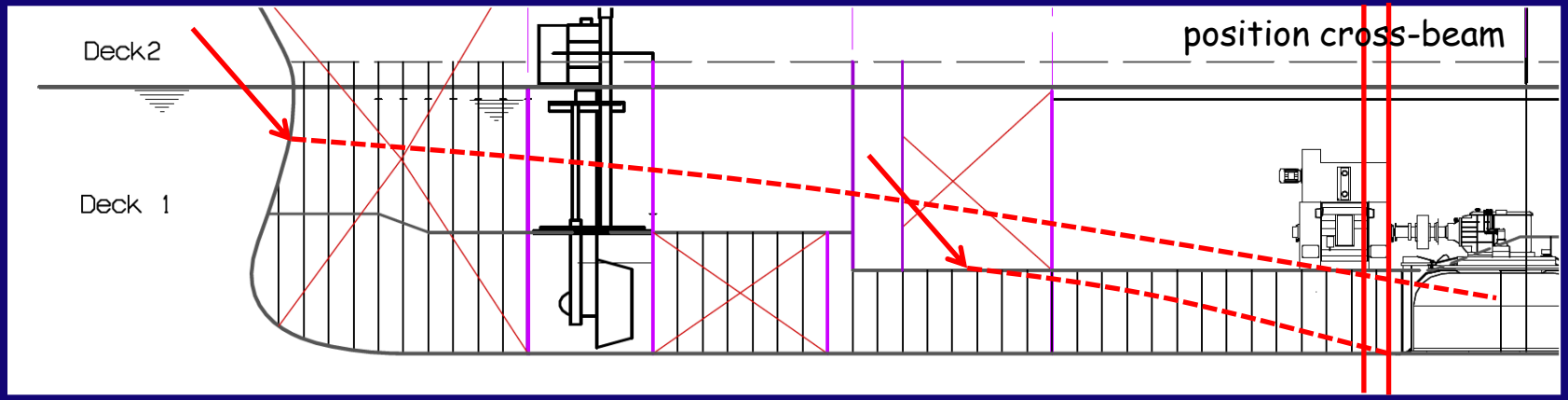




- now: hull with integrated gondola, an optimized 'dent' and optimized, slightly different bow-form



- computer simulations as well as tank tests show bubble sweepdown behind last cross-beam of hydroacoustic devices



RV SONNE

design

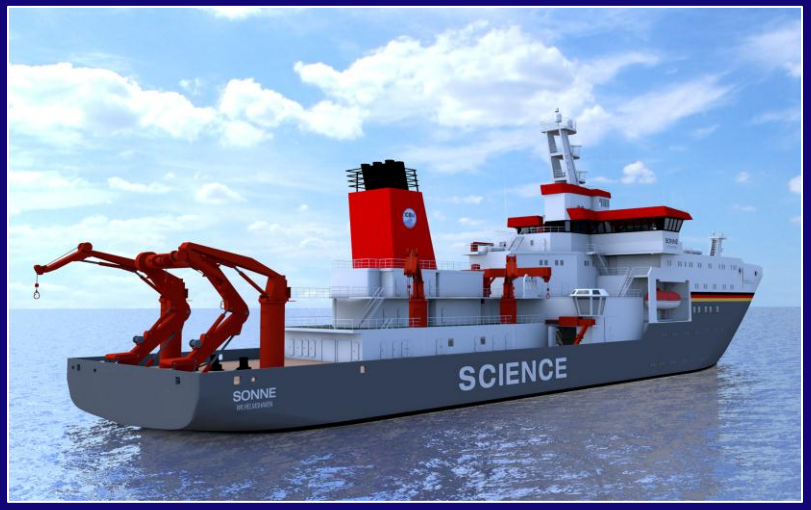
a new design for German research vessel should:

- show: these are German vessels
- show: these are special (research) vessels
- be: safe and maintenance friendly

several suggestions from shipyard, controlling station and two design offices

RV SONNE

design



result: - dark grey hull with German banderole
- white superstructure
- red lifting gear and funnel
- "SCIENCE" label on both sides

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ready for science: end of 2014

thanks for your attention

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